United States Patent

[11] **3,583,589**

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[54] **SIDE DUMPING BUCKET WITH EXTENSION MEMBER**
2 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **214/768,** 37/117.5, 37/118, 214/145
[51] **Int. Cl.** **E02f 3/83**
[50] **Field of Search** ..... 37/117.5, 118; 214/140, 140 A, 761, 762, 768, 145, 146

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ABSTRACT: A digging bucket adapted for side dumping in one or two directions is open at one or both lateral ends. At said one or both open ends the bucket has an extension member which cooperates with the bottom of the bucket and which during side dumping is movable from a retracted position to an active position in which it forms a laterally outwardly projecting extension of the bucket bottom so as to deposit the excavated material at a distance from the excavating vehicle.

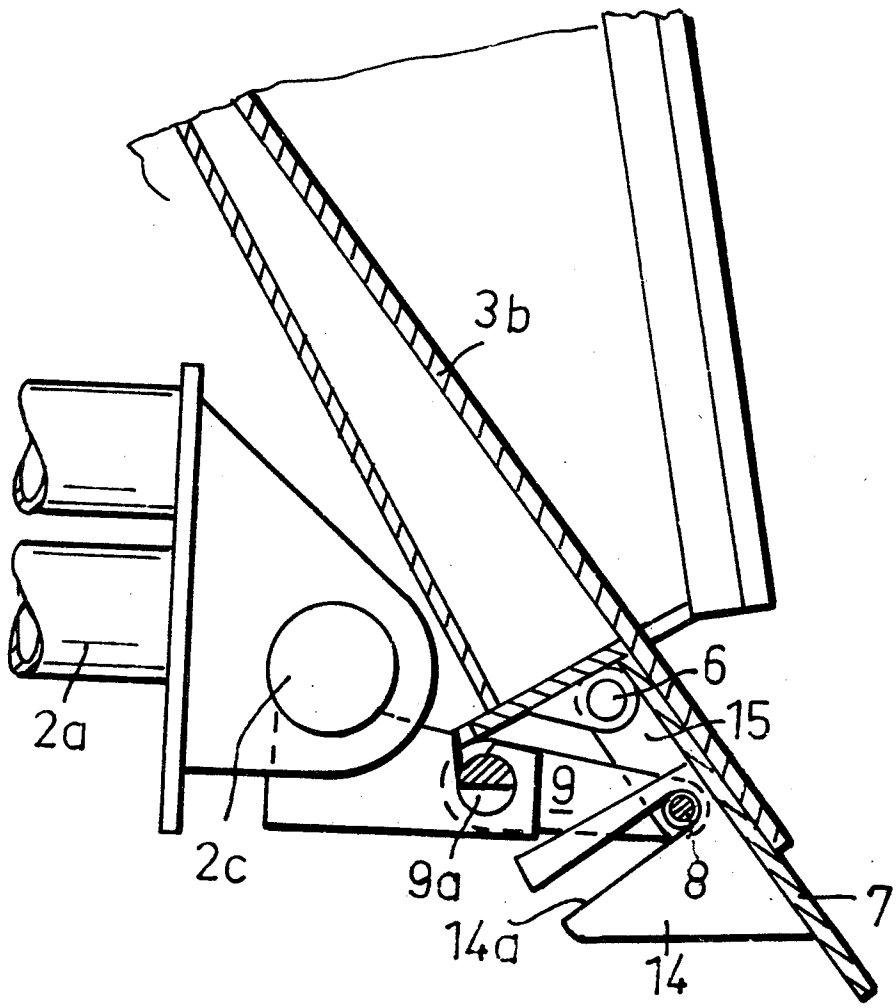


FIG.1

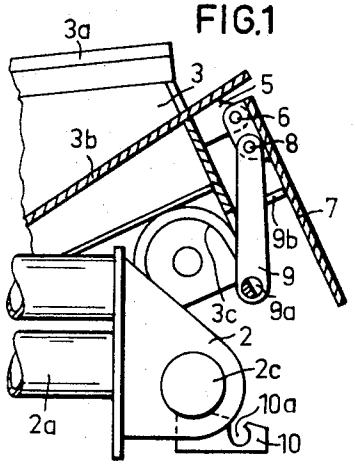


FIG.2

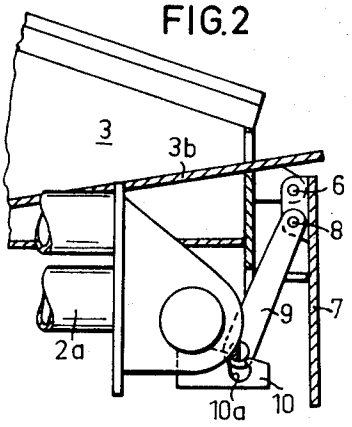


FIG.3

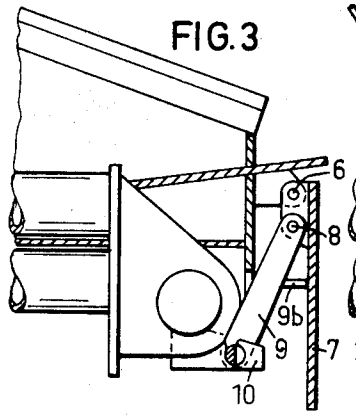


FIG.4

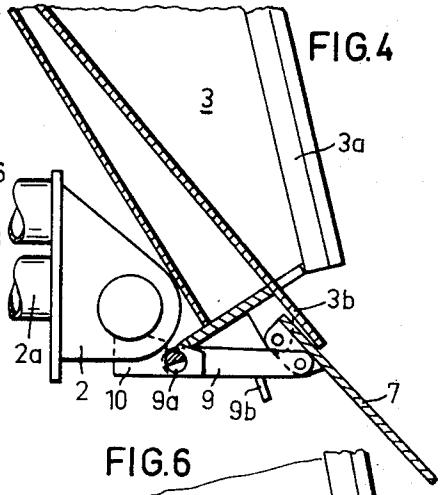


FIG.5

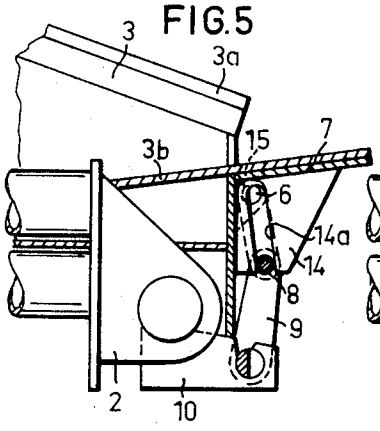
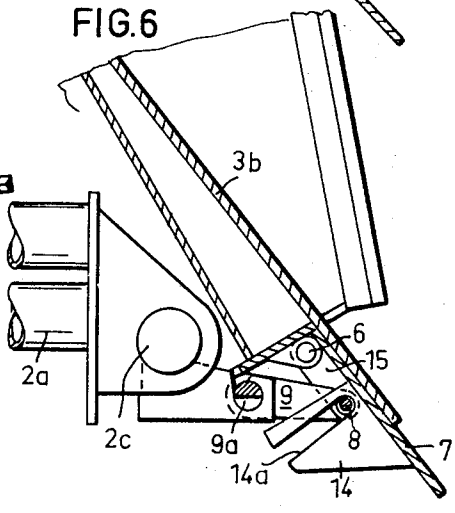


FIG.6



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SIDE DUMPING BUCKET WITH EXTENSION MEMBER

The present invention is concerned with a side dumping bucket which includes a front wall provided with a digging edge made of a hard material, a rear wall and a bottom member positioned between said walls, means for laterally dumping excavated material on either or both ends of the loading machine, said bucket being open at one or both lateral ends, the bottom of said bucket sloping upwardly towards said open end or ends.

It is previously known in side dumping buckets to use movable end walls of the bucket which swing outwards during the dumping movement of the bucket to empty the contents thereof. One of the disadvantages associated with such a bucket, however, is that it causes a rather appreciable increase in digging resistance in addition to being incapable of guiding the ejected material during lateral dumpings in an advantageous manner.

The object of the invention is to circumvent the disadvantages associated with known side dumping buckets by extending the bottom of the bucket so that it is ensured that under all circumstances all excavated material in the bucket when side dumping is emptied on the outside of the excavating machine, even if the bucket is fitted to a very wide machine.

This and further objects of the invention are fulfilled by means of the arrangement according to the invention, which is mainly characterized by a movable extension member which cooperates with the bottom of the bucket and which is adapted to move from a retracted or inwardly swung position, adopted during a digging operation below the outer end portion of the bucket bottom member, to an active position during a dumping operation in which it forms a laterally, outwardly projected extension of the bottom of the bucket to deposit the material at a distance from the excavating vehicle.

Two embodiments of the invention will now be described in detail with reference to the accompanying drawing.

In the drawing:

FIGS. 1—4 show vertical sections through a part of a bucket capable of being tilted in two directions, and associated holder means, the bucket being provided with a swingable extension member when the bucket is tipped.

FIGS. 5 and 6 show vertical sections through a modified embodiment of the bucket in which the extension member is adapted to move parallel with the bottom of the bucket during dumping. Corresponding details in the different figures are identified with the same reference numerals.

In the drawing is shown an excavating unit of a loading machine, the unit consisting of two main parts namely a holder or bucket support 2 and a bucket 3 carried thereby. The holder or bucket support 2 consists of a tube 2*a* and is capable of pivoting about an essentially horizontal axis which is perpendicular to the long direction of the loading machine and carried by its loading arms (not shown).

The digging bucket 3 is substantially in the shape of a U or a cradle, and is provided with a leading, digging edge 3*a* of hard metal. The bucket presents open lateral ends and the height of its bottom portion 3*b* increases towards said ends which endows the bucket with better characteristics than if the bottom of the bucket were substantially flat.

Mounted at each end of the holder 2 and bucket 3 are corresponding bearing means 2*c*, 3*c* which ensure fixing of the bucket to the holder in the central digging position.

Each of the bearing means includes releasable latching pins which are so adapted that subsequent to releasing the latch pin of one bearing means the bucket can pivot laterally about the other latch pin, for example when actuated by a central working cylinder (not shown) pivotally connected to the bucket and holder.

In the embodiment illustrated in FIGS. 1—4 there is provided underneath the bottom 3*b* of the bucket a bearing shaft 6 which is attached to a welded lug 5 and cooperates with a swingable extension member 7. Connected to the extension

member 7 in a pivot 8 is an operating arm 9 which presents at its lower end a trunnion 9*a*. The trunnion 9*a* is capable of being inserted into a recess 10*a* in a lug 10 attached to the holder. Attached to the operating arm 9 is a stop member 9*b* which cooperates with the extension member 7.

In the position shown in FIG. 1 the bucket is in a tilted position to the left about opposing bearing means (not shown). The trunnion 9*a* of the operating arm 9 has hence left the recess 10*a* in lug 10. Upon return of the bucket to the digging position shown in FIG. 3 via an intermediate position shown in FIG. 2 the operating arm 9 is guided in a convenient manner so that the trunnion 9*a* enters the recess 10*a*. Since lateral tipping of the bucket then occurs clockwise about the bearing means 2*c*, 3*c* (not shown in FIGS. 3 and 4) the extension member 7 is swung upwards in a direction opposite to that in which the bucket tilts to the position shown in FIG. 4, i.e., so that the extension member is essentially parallel with the bottom 3*b* of the bucket. The excavated material in the bucket is thus deposited without risk of any part thereof falling onto the machine to cause damage thereto.

In the embodiment shown in FIGS. 5—6 the extension member 7 is capable of being moved parallel to the bottom 3*b* of the bucket as opposed to the arrangement in the aforedescribed embodiment. In this embodiment the extension member 7 is provided with a downwardly extending flange 14 presenting a slot 14*a*.

Connected to the shaft 6 on lug 5 is a link 15 which is pivotally connected by the pivot 8 with the operating arm 9 having a trunnion 9*a* which as shown in FIGS. 5 and 6 is inserted in the recess 10*a* in the lug 10. When tilting the bucket clockwise the trunnion 8 moves in the slot 14*a* whereupon the extension member moves parallel to the bottom of the bucket to the position shown in FIG. 6. Upon return counter to the digging position a corresponding inward movement of the extension member 7 takes place, and when dumping on the opposite side a corresponding outward movement is effected of an extension member arranged on the other side of the bucket.

As will be seen from the drawing, when dumping sideways the outer edge of the bucket, from which the excavated material is deposited, swings inwardly so that said outer edge moves inwards relative to a low vertical plane through the open side ends of the bucket in the digging position. This means that when tilting the bucket to digging position the material depositing portion of the bucket moves successively nearer the central portion of the loading machine. This is compensated for by the invention from the moment that dumping is commenced since the outer side edge of the bucket together with the movable expansion member are always tangential to or cut said vertical plane. In this way all risk is completely eliminated of deposited material falling and damaging any part of the machine.

In certain instances it is sufficient to design the extension member as an essentially flat slide board although it is preferred that the extension member is curved to present substantially the same radius as the bottom of the bucket at the ends thereof. The extension member may also be constructed to contribute towards ejecting the material when it leaves the bucket during side dumping operations.

What I claim is:

1. An excavating and loading machine comprising a bucket, a holder therefore, said bucket having a front wall provided with a digging edge of hard material, a rear wall, a bottom member positioned between said walls, means for tilting said bucket for dumping material therefrom laterally to at least one side of the machine, said bucket being open at at least one of its lateral ends, the bottom member of said bucket sloping upwardly towards said at least one open end when in a horizontal position, at least one movable extension member disposed substantially parallel to and beneath said bottom member of said bucket when said bucket is not tilted for dumping and movable with the tilting movement of said bucket, means operable by said tilting means for moving said at least one ex-

tension member parallel to said bottom member to an active position extending laterally and projecting outwardly from the bottom member of said bucket when said bucket is tilted to dump material at a distance away from he machine.

2. A machine as claimed in claim 1 wherein said bucket is open at both lateral ends thereof and there are provided extension members for each open end, each of said extension members being disposed substantially parallel to one end of the bottom member of said bucket when disposed beneath the bottom member of said bucket and when extended laterally into its active, outwardly projected position.